

Appln. No. 10/730,784
Amendment filed November 30, 2005
Response to Office Action mailed on July 5, 2005

LISTING OF CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. (Currently Amended) A liquid cartridge comprising:

a liquid containing section for containing a liquid;

a cartridge body ~~which comprises~~ having a liquid supplying part ~~for supplying~~ that supplies the liquid in said liquid containing section to outside, a wall face, and a concave part formed in the wall face of the cartridge body, the concave part itself having a wall face;

a valve member contained in ~~at the~~ the concave part ~~formed at of~~ of said cartridge body ~~to be opened and which opens~~ when a sufficient pressure difference between said liquid containing section and said liquid supplying part occurs; and

a valve lid ~~for holding that holds~~ that holds said valve member by being fitted into said concave part and ~~besides pressing also presses~~ presses an outer circumference of said valve member toward ~~at the~~ the wall face of said concave part;

~~wherein a projection is formed on a surface of said wall face in said concave part, with which said valve member is in contacting said projection, of said wall face in said concave part to be in pressure contact with said valve member along said outer circumference of said valve member;~~

a seal member that urges an outer surface of said valve lid opposite to a surface, on which said valve member is provided, and a wall face of said cartridge body around said outer surface of said valve lid in a direction so that said valve lid is in contact with said projection.

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2. (Currently Amended) A liquid cartridge as claimed in claim 1, wherein said valve lid ~~comprises~~includes a valve member contact part provided to face said projection holding said valve member ~~for pressing~~and press said valve member toward said projection by being in contact with said valve member.

3. (Cancelled).

4. (Currently Amended) A liquid cartridge as claimed in claim 1, wherein said valve member is formed of an elastic material, and said projection ~~is in pressure contact~~presses against said valve member, deforming said valve member.

5. (Currently Amended) A valve unit accommodated within a liquid cartridge body which includes a liquid containing section ~~for containing therein~~ that contains liquid therein and a liquid supplying section ~~for supplying~~that supplies the liquid to ~~the outside of the cartridge body~~, the valve unit comprising:

a valve member which is elastically deformable to open ~~in accordance with a when there is a sufficient~~ pressure difference ~~generated between the liquid containing section and the liquid supplying section~~, said valve member ~~comprising~~having a cylindrical peripheral edge;

a valve lid ~~comprising~~having a substantially cylindrical valve member holding part ~~inserting inside~~disposed within said peripheral edge of said valve member ~~for fixing to fix~~ said peripheral edge; and

an urging member provided between said valve member and said valve lid ~~for urging to urge~~ said valve member in a direction away from said valve lid.

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6. (Currently Amended) A valve unit as claimed in claim 5, wherein said valve lid further ~~comprises~~includes a wall surface contact part of a substantially cylindrical shape, of which an inner diameter is larger than an outer diameter of said peripheral edge part of said valve member, surrounding said valve member holding part, ~~being in contact with~~and contacting a wall face of a concave part ~~formed at~~of said cartridge body to which said valve lid is attached.

7. (Currently Amended) A valve unit as claimed in claim 5, wherein said urging member is a coil spring,

said valve lid ~~comprises~~includes a cylindrical spring fitting part ~~of a cylindrical shape~~, of which an inner diameter is substantially the same as an outer diameter of said coil spring, the cylindrical spring fitting part projecting to face toward said valve member at a position ~~on which~~where said coil spring is in contact, and

said coil spring is held in said valve lid by being ~~fitted into~~at least partially contained within said spring fitting part.

8. (Currently Amended) A valve unit as claimed in claim 7, wherein said spring fitting part has a notch ~~enabling through which~~ a liquid ~~to flows~~ into and/or out of said spring fitting part, even ~~though when~~ said valve member is attached ~~to~~coil spring is contained within said spring fitting part.

9. (Currently Amended) A valve unit as claimed in claim 8, wherein said spring fitting part has a plurality of notches cut in away from said valve member to define a plurality of projecting pieces, and

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~~at least one of lengths of a plurality of projecting pieces in a surface direction~~
~~formed by said plurality of notches~~wherein at least one of the projecting pieces has a dimension
in a surface direction that is larger than an inner diameter of said coil spring.

10. (Currently Amended) A valve unit as claimed in claim 5, wherein said urging member is a coil spring,

~~wherein said valve member comprises~~includes a substantially cylindrical valve lid
~~side projecting part of a substantially cylindrical shape, and~~ of which at least a part of an outer diameter is larger than an inner diameter of said coil spring, ~~projecting to face toward~~ said valve lid at a position ~~on which~~where said coil spring ~~is in contacts~~ said valve member, and

~~said coil spring is held in said valve member by inserting~~wherein at least a portion
of said valve lid side projecting part projects into said coil spring.

11. (Currently Amended) A valve unit as claimed in claim 5, wherein said urging member is a coil spring,

~~wherein said valve member comprises~~includes a substantially cylindrical valve lid
~~side projecting part of substantially cylindrical shape, and~~ of which at least a part of an inner diameter is smaller than an outer diameter of said coil spring, ~~projecting to face toward~~ said valve lid at a position ~~on which~~where said coil spring ~~is in contacts~~ said valve member, and

wherein at least a portion of said coil spring is held in said valve lid by being
fitted into said valve lid side projecting part of said valve lid.

12. (Currently Amended) A valve unit as claimed in claim 5, wherein said valve member ~~comprises~~includes a seal part provided to project toward an opposite side to projecting

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away from said urging member at a location corresponding to a position ~~at which~~ where said valve member is urged by said urging member, ~~for preventing to prevent~~ said liquid containing section and said liquid supplying part from communicating with each other by being urged by said urging member toward a wall face side of a concave part ~~formed at~~ of said cartridge body.

13. (Original) A liquid cartridge comprising said valve unit as claimed in claim 5.

14. (Currently Amended) A method for manufacturing a liquid cartridge, which ~~comprises~~ includes a liquid containing section for containing a liquid, a cartridge body ~~comprising~~ having a liquid supplying part ~~for supplying that supplies~~ said liquid in said liquid containing section to outside, a wall face, and a concave part formed in the wall face of the cartridge body, the concave part itself having a wall face, and a valve unit comprising a valve member contained in said cartridge body ~~to be opened and which opens~~ when a sufficient pressure difference between said liquid containing section and said liquid supplying part occurs, the valve member having a peripheral edge part, of which a peripheral edge is cylindrical in shape, and which is elastically deformable based on said pressure difference, comprising the steps of:

preparing said cartridge body ~~comprising~~ having said liquid containing section and a valve unit containing section, which is ~~at the~~ the concave part formed ~~at in~~ in said cartridge body, communicating with said liquid containing section;

forming a valve unit by putting an urging member, which urges said valve member ~~toward a direction being distanced in a direction~~ away from said valve lid, between said valve member ~~comprising a peripheral edge part, of which a peripheral edge is cylindrical in shape, elastically deformable based on said pressure difference and~~ a valve lid ~~comprising~~ having

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a substantially cylindrical valve member holding part of a ~~substantially cylindrical shape for~~
~~fixing that fixes~~ said peripheral edge part by being inserted into said peripheral edge part of said
valve member; and

attaching said valve unit to said valve unit containing section.

15. (Currently Amended) A method for manufacturing a liquid cartridge as
claimed in claim 14, further comprising a step of sealing by with a sealing member ~~to cover an~~
outer surface ~~opposite to of said valve lid opposing~~ a surface, on which said valve member is
provided, ~~of said valve lid~~ and a wall face of said cartridge body around said outer surface of
said valve lid.

16. (Currently Amended) A method for manufacturing a liquid cartridge as
claimed in claim 14, wherein said attaching step ~~comprises~~ includes a step of forcing a projection
to be in pressure contact with said valve member, and

said projection is provided along an outer circumference of said valve member on
a wall face with which said valve member of said ~~pressure difference regulating~~ valve unit
containing section is in contact.

17. (New) A liquid cartridge as in claim 1, wherein said valve member is softer
than said projection.

18. (New) A liquid cartridge as in claim 1, further comprising:
an urging member provided between said valve member and said valve lid for
urging said valve member in a direction away from said valve lid, and

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wherein said valve member includes a seal part that projects toward an opposite side to said urging member corresponding to a position at which said valve member is urged by said urging member, for preventing said liquid containing section and said liquid supplying part from communicating with each other by being urged by said urging member toward the wall face side of the concave part formed of said cartridge body.

19. (New) A liquid cartridge as in claim 2, wherein said valve member includes a bent part provided at a position closer to a center part thereof than a position where said projection is in contact.

20. (New) A liquid cartridge as in claim 1, further comprising:

a coil spring provided between said valve member and said valve lid to urge said valve member in a direction away from said valve lid; and

wherein said valve member includes a valve lid side projecting part of substantially cylindrical shape, and of which at least a part of an outer diameter is larger than an inner diameter of said coil spring, projecting toward said valve lid at a position where said coil spring contacts said valve member, and

wherein at least a portion of said valve lid side projecting part projects into said coil spring.

21. (New) A liquid cartridge as in claim 1, further comprising:

a coil spring provided between said valve member and said valve lid to urge said valve member in a direction away from said valve lid; and

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wherein said valve member includes a substantially cylindrical valve lid side projecting part, and of which at least a part of an inner diameter is smaller than an outer diameter of said coil spring, projecting toward said valve lid at a position where said coil spring contacts said valve member, and

wherein at least a portion of said coil spring is fitted into said valve lid side projecting part of said valve lid.

22. (New) A liquid cartridge as in claim 1, wherein said valve lid further includes a substantially cylindrical wall face contact part provided around said valve member contact part; and wherein said wall face contact part is thicker than both said valve member contact part and a part of said valve member with which said valve member contact part is in contact.

23. (New) A liquid cartridge as in claim 1, wherein the valve member does not have a through hole.

24. (New) A valve unit as in claim 5, wherein the valve member does not have a through hole.

25. (New) A method as in claim 14, wherein the valve member does not have a through hole.